

Claims:

1. A label printer for printing on a direct thermal tape in a plurality of colours, said label printer comprising:

5 at least one print head for printing an image on said tape in said plurality of colours; and
an interface for selecting at least one background colour and at least one text colour.

2. A printer as claimed in claim 1, wherein said interface comprises a keyboard.

10 3. A printer as claimed in claim 1 or 2, wherein the printer is arranged to permit the user to select a single colour for said image and a single different colour for said background.

15 4. A printer as claimed in any preceding claim, wherein said background comprises one of a pattern, text, image and plain colour.

5. A label printer for printing on a direct thermal tape in a plurality of colours, said label printer comprising:

20 at least one print head for printing a background image; and
at least one different print head for printing a text image.

6. A label printer for printing on a direct thermal tape in a plurality of colours, said label printer comprising:

25 at least one print head for printing an image on said tape, wherein a background is printed in a first colour and an image is printed in a second colour.

7. A label printer for printing on a direct thermal tape in a plurality of colours, said label printer comprising;

at least one print head, said print head having a plurality of printing elements, wherein at least some of said printing elements are individually controllable and at least some of said printing elements are divided into at least one group which are commonly controlled.

5 8. A label printer for printing on a direct thermal tape in a plurality of colours, said label printer comprising;

at least one print head, said print head having such that the print head can print across the entire width of said tape, said print head having a plurality of printing elements which are individually controllable, said individually controllable printing elements corresponding to a 10 part of the print head which is arranged to print an image on said tape and at least one group of printing elements which are commonly controlled and which correspond to a part of the print head which is arranged to print a background on said tape between said image and at least one of said upper and lower edges of said tape.

15 9. A tape supply for use in a tape printing apparatus, said tape supply comprising a roll of direct thermal image tape, said direct thermal image tape comprising a plurality of thermally activated colourants and at least one developer for producing a multi coloured image on said direct thermal image tape when said direct thermal image tape is heated.

20 10. A tape supply for use in a tape printing apparatus, said tape supply comprising a roll of direct thermal image tape, said direct thermal image tape comprising at plurality of thermally activated colourants and at least one developer for producing a multi coloured image on said direct thermal image tape when said direct thermal image tape is heated, said tape further comprising an outer protective layer.

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11. A tape supply as claimed in claim 10, wherein said protective layer comprises polyolefin or polypropylene.

12. A tape supply as claimed in claim 10 or 11, wherein said protective layer is arranged to contact a print head in use.

13. A tape supply as claimed in any of claims 10 to 12, wherein said protective layer has a
5 thickness of between 3 and 15 micrometers.

14. A tape supply as claimed in any of claims 10 to 13, wherein a removable backing layer is provided, opposite to said protecting layer.

10 15. A tape supply as claimed in any of claims 10 to 14, wherein a portion of said tape supply is cut off to form a label.

16. A tape supply as claimed in any of claims 10 to 14, wherein a top surface of said protective layer is coated in a friction reducing material.

15 17. A tape supply as claimed in any of claims 9 to 16, wherein said thermally activated colourants comprise dyes.

18. A tape supply as claimed in claim 17, wherein said dyes comprise leuco dyes.

20 19. A tape supply as claimed in any of claims 9 to 18, wherein each respective thermally activated colourant has a different activation temperature at which a colour is formed whereby in use any one of the thermally activated colourants can be individually activated to produce a colour without activating the other thermally activated colourants.

25 20. A tape supply as claimed in one of claims 9 to 19, wherein said tape is adapted to produce a multi coloured image by one or more of thermal diffusion, chemical dissolution, melting transitions and chemical thresholds.

21. A tape supply as claimed in any of claims 9 to 20, wherein said tape comprises a substrate layer, and a print layer comprising an image-forming layer.

22. A tape supply as claimed in claim 21, wherein said image-forming layers comprise 5 one or more of a dispersion of solid material, an encapsulated liquid, amorphous materials, solid materials, solutions of activatable materials and polymeric binders.

23. A tape supply as claimed in any of claims 9 to 22, wherein the tape comprises an upper image-forming layer being selectively activatable to produce a colour by applying heat 10 to the tape at a temperature T1 for a time period t1 and a lower image-forming layer being selectively activatable to produce a colour by applying heat to the tape at a temperature T2 for a time period t2 wherein $T1 > T2$ and $t1 < t2$, whereby in use either of the upper or lower layers can be activated separately from the other.

15 24. A tape supply as claimed in any of claims 9 to 23, wherein said tape comprises a plurality of image-forming layers, wherein each respective image-forming layer contains a different thermally activated colourant.

20 25. A tape supply as claimed in claim 24, wherein said tape comprises one or more spacer layers, each spacer layer being disposed between said image-forming layers.

25 26. A tape supply as claimed in claim 25, wherein the one or more spacer layers comprise one or more of a thermally inert material, a material which undergoes a phase change on heating by a thermal print head, a thermal solvent and a polymeric material.

27. A tape supply as claimed in claim 25 or claim 26, wherein the thickness and the thermal conductivity of the one or more spacer layers is selected whereby in use any one of the thermally activated colourants can be individually activated to produce a colour without activating the other thermally activated colourants.

28. A tape supply as claimed in any of claims 10 to 27, wherein said tape comprises: a substrate layer having an upper and a lower surface; a first image-forming layer disposed on the upper surface of the substrate layer; a first spacer layer disposed on the first image forming layer; and a second image-forming layer disposed on the spacer layer.

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29. A tape supply as claimed in claim 28, wherein an adhesive layer is disposed on the lower surface of the substrate layer and a base layer is disposed on the adhesive layer, said base layer being removable to expose the adhesive layer for attachment of said tape to a surface.

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30. A tape supply as claimed in claim 28 or claim 29, wherein a second spacer layer is disposed on the second image-forming layer and a third image-forming is disposed on the second spacer layer.

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31. A tape supply as claimed in any of claims 9 to 30, wherein said tape comprises a plurality of developers, each developer having a different activation temperature.

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32. A tape supply as claimed in claim 31, wherein each developer is disposed in a different image-forming layer in said tape.

33. A tape cassette for use in a tape printing apparatus, said tape cassette comprising a body housing a supply of direct thermal image tape according to any of claims 9 to 32.

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34. A tape cassette as claimed in claim 33, wherein said cassette comprises an indicating means for indicating the type of direct thermal image tape housed in the cassette.

35. A tape cassette as claimed in claim 33, wherein said indicating means are arranged to provide information as to the colours available from said direct thermal image receiving tape.

36. A tape printer comprising a tape supply receiving portion for receiving a supply of tape, a print head comprising a plurality of printing elements for printing an image on a tape, a drive means for driving a tape passed the print head and a control means for controlling the plurality of printing elements, wherein the control means is adapted to control the printing elements for producing a multicoloured image on a tape by direct thermal transfer.

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37. A tape printer according to claim 36, wherein said control means is adapted to produce a multicoloured image on a tape by direct thermal transfer in a single pass.

10 38. A tape printer according to claim 36 or claim 37, wherein said control means is adapted to control the printing elements according to data input to the tape printer.

39. A tape printer according to any one of claims 36 to 38, wherein said control means is a processor.

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40. A tape printer according to any one of claims 36 to 39, wherein said control means is adapted to control the temperature of each printing element.

41. A tape printer according to any one of claims 36 to 40, wherein said control means is adapted to control the time period each printing element is heated.

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42. A tape printer according to any one of claims 36 to 41, wherein said control means comprises a memory storing at least one of temperature, heating period and colour data which is accessible to select a temperature and heating period for each printing element according to data input to the printer.

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43. A tape printer according to any one of claims 36 to 42, wherein said memory stores at least one of temperature, heating period and colour data for different types of direct thermal tape.

44. A tape printer according to claim 43, wherein said printer comprises a detection means for detecting the type of direct thermal tape inserted in the printer and wherein the detecting means sends a signal to the control means whereby the data corresponding to the detected 5 tape type is selected.

45. A tape printer as claimed in claim 44, wherein said tape printer is arranged to detect if a thermal transfer tape material has been installed in said tape printer and to control the tape printer accordingly.

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46. A method of printing a label comprising driving a direct thermal tape passed a thermal print head and controlling the print head whereby a multicoloured image is produced on the tape by direct thermal transfer in a single pass.

15 47. In combination, a tape printer as claimed in any of claims 1 to 8 or 36 to 45, with a tape supply as claimed in any of claims 9 to 35.

48. A label printer for printing, said label printer comprising:
at least one print head for printing an image, whereby a background of one label is
20 different to that of a second, subsequent label; and
cutting means for providing a cut on either side of a region between said first and
second labels, where said first and second backgrounds meet.

49. A printer as claimed in claim 48, wherein the at least one print head is arranged to
25 print information on said region between said first and second labels.

50. A printer as claimed in claim 48, wherein at least one of said cuts is a partial cut.

51. A printer as claimed in claim 48 or 50, wherein at least one of said cuts is a full cut.

52. A printer as claimed in any of claims 48 to 51, comprising reversing means for reversing image receiving medium on which said labels are arranged to be printed.

5 53. A printer as claimed in claim 52, wherein said reversing means are arranged to reverse said medium from the cutting means to said at least one print head.

10 54. A printer as claimed in any of claims 48 to 53, wherein at least one of said at least one print heads is arranged to start printing an image on said image receiving medium on one side of a partial cut provided by said cutting means and to continue printing on the other side of said partial cut.

15 55. A printer as claimed in any of claims 48 to 54, wherein said cutting means is arranged to provide a cut, said cut being at a position such that one background extends both sides of said cut.

56. A printer as claimed in claim 55, wherein said one background extends only a relatively small distance on one side of said cut.

20 57. A printer as claimed in any of claims 48 to 56, wherein at least one print head is arranged to print backgrounds on said first and second labels in different colours.

25 58. A label printer for printing an image, said label printer comprising:
at least one print head for printing on a tape a first image for a first label and a second different image for a second label, said first and second labels being adjacent; and
cutting means for providing a cut on either side of a region between said first and second labels, where said first and second images meet.

59. A method of printing an image comprising the steps of:

printing a first label on a supply of continuous tape; and
moving the tape to a printing position for printing a second label, initial
printing being on one side of a partial cut and subsequent printing being on another side of
said partial cut.

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60. A method as claimed in claim 59, comprising the step of:
cutting at least partially said tape when said image has been printed, said cut being
through said image.

10 61 A method as claimed in claim 59 or 60, wherein said cut is through a background
image.

15 62. A label printer for printing an image on a label, said printer comprising:
printing means for printing an image on said label, said printing means having a
length, said length being greater than a corresponding dimension of said label, wherein when
a background image is printed on said label, said printing means is controlled to print said
background image over a length at least equal to said corresponding dimension of label.

20 63. A label printer as claimed in claim 62, wherein said printing means comprises printing
elements and said printing means is arranged to print said background image by activating a
number of printing elements sufficient to print said image over said length at least equal to the
corresponding dimension of label.

25 64. A label printer as claimed in claim 62 or 63, wherein said background image is
arranged to be printed over a length greater than said corresponding dimension of label.

65. A printer as claimed in any of claims 48 to 58 or 62 to 64, wherein said printer is
arranged to print a colour image.